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SPACE CENTER Roundup

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Atlantis crew delivers heart of the space station

Space Shuttle *Atlantis* glided to a belated but textbook touchdown at Edwards Air Force Base, Calif., at 2:33 p.m. CST Feb. 20, successfully wrapping up a 5.3-million-mile mission to deliver the U.S. Laboratory Destiny to the International Space Station.

With STS-98 Commander Ken Cockrell at the controls, *Atlantis* darted through high clouds over the Mojave Desert test center to touch down on concrete runway 22. The landing was the 47th at Edwards and brought the 102nd flight in program history to a close.

Cockrell and fellow crewmembers—Pilot Mark Polansky and Mission Specialists Tom Jones, Marsha Ivins and Bob Curbeam—returned to Ellington Field at about 3:30 p.m. CST the next day where they were greeted by a crowd of well-wishers.

“We had a wonderful flight,” Cockrell told those in attendance. “I know it’s pleased a lot of people, but it wasn’t all our doing. We did our part, I guess, but we’re here to say a really huge ‘thank you’ to all of you that put this flight together and got us ready for it.”

“The reason a flight goes well is because things come together and things don’t go wrong, and very few things went wrong on this flight, which enabled the big picture to come together so smoothly. It’s a testament to the hard work that’s gone into the Space Station Program, the Space Shuttle Program—getting *Atlantis* ready to carry the precious cargo up to the station—to the people that are running station and running space shuttle operations here on the ground at MOD [Mission Operations Directorate] and the

people in MOD that provided the fabulous training that we’ve had for about two and one-half years now to get ready for this flight.”

Cockrell took the opportunity to express greetings from the Expedition One crew. “Bill Shepherd sends his greetings to all of you. He’s having a great time up there. I can’t imagine a better crew to inaugurate the space station era.”

Polansky, completing his first flight in space, had a few words to say about his commander: “He ran a great crew, and he really enabled us to do our jobs. He was there to provide oversight for the whole program. He did a remarkable job on the rendezvous and docking. And it was, from my viewpoint, a fantastic landing. It was for me a privilege to get to work with a pro on my first flight.”

Polansky thanked all those who worked so hard to make the mission a success. “The last two weeks have been a dream come true. It was just something that I’ve wanted to do my entire life and I just can’t believe that I finally got to do it. As great an honor and a privilege as that was, I’m not naïve enough to think that flying in space is about me or about

us because it’s really all about you. Our nation’s space program is all about individuals like yourself who put in so many hours of work so that we get to go up there and be on TV for a couple of weeks doing things.”

Left on orbit is the U.S. Destiny Laboratory, which was installed onto the ISS Feb. 10 in a dazzling display of robotics finesse and space-walking skill.

Ivins began the work of installing the laboratory, using *Atlantis*’ robotic arm to remove Pressurized Mating Adapter 2 (PMA 2), a station docking port, from the Unity module to make room for Destiny. The adapter was removed from Unity and latched into a temporary position on the station’s truss. Then Jones and Curbeam began a space walk that continued throughout the day, in tandem with Ivins’ robotic work. Jones provided Ivins visual cues as she moved the adapter to its temporary position, and Curbeam removed heater power connections from *Atlantis* to the lab before unberth.

Ivins then latched the robotic arm onto the Destiny lab and began lifting it from *Atlantis*’ payload bay. High above the bay, Ivins deftly flipped the 16-ton lab 180 degrees, moving it into position to

attach to the station berthing port. At 12:57 p.m. CST, the lab was latched into position on the station, and soon a set of automatic bolts tightened to hold it permanently in place for years to come. With Destiny secured to the station, Jones and Curbeam connected electrical, data and cooling lines.

Jones and Curbeam breezed through the second space walk of the mission on Feb. 12, attaching the PMA 2 to the end of the new Destiny module and completing all of the space walk’s planned tasks and more.

During the second space walk, Jones helped Ivins remove PMA 2 from the Z-1 Truss by manually opening latches on the truss. Curbeam relocated himself to the end of the lab and provided clearance cues to Ivins as she berthed PMA 2 to the end of the lab. Curbeam attached a vent to the lab’s pressure control system.

Curbeam and Jones then moved rapidly through a variety of tasks, including attaching a vent to part of the lab’s air system and putting wires, handrails and sockets on the exterior of Destiny as aids for future space walkers. Ahead of schedule for the second space walk of the mission, they connected several computer and electrical cables between the docking port and the lab and unveiled the lab’s large, high-quality window and attached an exterior shutter.

Jones and Curbeam completed the third space walk of the mission on Feb. 14.

Space-walking tasks included going to the top of the P6 Truss to inspect latches on the solar array and testing the ability of space walkers to carry an immobile crewmember back to the shuttle airlock.

Ivins reflected on the successful work performed on orbit, calling it a “miracle.”

“I just got to say that was a miracle,” said Ivins, who also served as the flight engineer on STS-98. “We are asking for

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STS98-E-5189
Astronaut Robert L. Curbeam, STS-98 mission specialist, holds onto handrail on Pressurized Mating Adapter 3 during the second of three scheduled space walks on 5A.



Roy Estess

NASA names Estess acting JSC director

Effective Feb. 23, Roy Estess, director of NASA’s Stennis Space Center in Mississippi, was detailed to JSC as the acting center director. NASA Administrator Daniel S. Goldin appointed former JSC Director George W. S. Abbey as his senior assistant for international issues.

Estess has served as director of Stennis Space Center since 1989, and was its deputy director from 1980 to 1989. A native Mississippian and a graduate of Mississippi State University, he began his career there in 1966 as a test engineer.

Abbey’s appointment came after a highly decorated 40-year career with

NASA in a variety of increasingly senior positions. He was named JSC director in 1996. As the focus of his new duties, Abbey will conduct, on a full-time basis, an assessment of the current International Space Station partner contributions, providing the administrator with a report analyzing past and potential future contributions that will help increase the overall effectiveness of the International Space Station Program.

Look for a tribute to former Center Director George W. S. Abbey in the next issue. ■



Columbia returns in time for its 20th birthday.

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New JSC archive will provide easy access.

Page 3



Volunteers expand their horizons.

Page 4

Improved *Columbia* returns to service

by James Hartsfield

On the eve of the 20th anniversary of its maiden voyage, *Columbia* is returning to service fresh from a year and a half of maintenance and upgrades that have made it better than ever.

"As its 20th birthday approaches, *Columbia* is fit to fly for many more years," Space Shuttle Program Manager Ron Dittmore said. "It is safer and more capable than it has ever been, a result of the thorough maintenance and continuous improvements that have been incorporated regularly into the shuttle fleet."

More than 100 modifications and improvements have been made to *Columbia*, highlighted by the installation of a new "glass cockpit" which replaced mechanical instruments with nine full-color, flat-panel displays. The new cockpit is lighter, uses less electricity and sets the stage for the next generation of improvements, a "smart cockpit" in development during the next five years that will make the cockpit more user-friendly. *Columbia* is the second of NASA's four space shuttles to be fitted with the new "glass cockpit." The Space Shuttle *Atlantis* was the first to fly in space with the "glass cockpit" on mission STS-101 in May 2000. The work on the "glass cockpit," technically called the Multifunction Electronic Display Subsystem (MEDS), has been overseen in large part by Jim Newsome, subsystem manager for MEDS in the Avionics Systems Division at JSC.

Work at Palmdale on *Columbia* began when it arrived there from Florida on Sept. 26, 1999. Other improvements that were made include weight reductions that have increased the amount of cargo *Columbia* can carry to orbit by hundreds

of pounds. To save weight, almost 1,000 pounds of unused wire—leftover from equipment and sensors that were used on *Columbia* for only the first few space shuttle test flights—were removed.

Due to multiple instances of wiring damage that were found in the shuttle fleet in 1999, comprehensive inspections of 95 percent of *Columbia's* more than 200 miles of wire were performed at Palmdale. To prevent such damage from recurring, technicians smoothed rough edges throughout the shuttle and encased wiring in high-traffic work areas in protective tubing. Also, about 1,500 feet of wiring was removed and replaced with new wiring.

The removed

wiring will be used for testing to verify that predictions of the characteristics of aging on shuttle wiring are accurate.

"The wiring work, the inspection and the removal of wiring was probably the most significant thing done at Palmdale in terms of time and manpower required," explained John Mulholland, deputy manager for operations in the Space Shuttle Vehicle Engineering Office. "It may also be one of the most significant safety enhancements we have made."

Normally, shuttle modifications are planned out as much as a year in advance, Mulholland added, but the wiring work on *Columbia* was planned

and begun in only a few months. Key to the success of the quick work on wiring enhancements was Doug White, director of operational requirements in the United Space Alliance's Orbiter Elements Office.

"The team did a great job quickly identifying and laying out what needed to be done and getting it in work," White said. "The effort really stretched coast-to-coast. People were involved from Houston, Florida, Boeing in Huntington Beach, California, and Boeing in Palmdale."

Such inspections and protective measures will be a regular feature of all future shuttle maintenance periods. Some work also was performed to better separate duplicate wires that provide power to critical shuttle systems, ensuring that a problem in one area would not affect both sets of wires.

The vast majority of such instances are avoided in the shuttle's original design, but work led by Frank Alanis of JSC Engineering's Energy Systems Division was a significant contribution to identifying a few areas in need of modification.

Also at Palmdale, preliminary preparations were made that could allow *Columbia* to use a space station docking system, enabling it to join the rest of the shuttle fleet as a courier to the International Space Station in the future if needed. In addition, *Columbia's* crew cabin floor was strengthened, the heat protection on its wings was enhanced and protection from space debris was added to its cooling system, making it a safer spacecraft.

While *Columbia* was in California, technicians scoured the shuttle during months of intensive structural inspections, using the latest technology to check for even minute signs of fatigue, corrosion or broken rivets or welds. ■



As its 20th birthday approaches, Columbia is fit to fly for many more years. It is safer and more capable than it has ever been, a result of the thorough maintenance and continuous improvements that have been incorporated regularly into the shuttle fleet.

— Ron Dittmore
Space Shuttle Program Manager

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ATLANTIS CREW DELIVERS

exponentially more from our systems, from our hardware and from our crews with increasingly less time. And a large part of our success in these missions has to do with luck. But a larger part has to do with those of you who worked as hard or harder than we did in making sure that we had hardware and systems and a crew that were ready to do this [mission]. And so to my amazing crew ... and to all of you who stuck by us to make sure we were ready, I'd just like to thank you for that miracle."

During the mission, the STS-98 and Expedition One crews transferred 3,000 pounds of equipment and supplies to the station from *Atlantis*, including water, food, spare parts, a spare Russian carbon dioxide removal system, a spare computer, clothes, movies and other items. About 850 pounds of material was moved from the station to *Atlantis*.

Outside the spacecraft, in addition to the Destiny lab and its associated equipment, Jones and Curbeam attached about 350 pounds of equipment to the station during their three space walks, including the spare antenna and a mounting fixture for the station's Canadian robotic arm that will be launched this spring.

Curbeam thanked all for their work in making the mission a success. "The true measure of how much hard work you put in was the success that we had on our mission. We had a couple of hiccups but we got over all of them and that's because you all worked so hard and trained us so

well for so long. I know you're glad that it all came to fruition—believe me, we all had big smiles on our faces when we came back and landed at Edwards."

With the addition of Destiny, the station's mass is now 112 tons. It measures 171 feet in length, 90 feet in height and 240 feet in width. It has a volume of 13,000 cubic feet, already a larger volume than any space station in history.

Jones was the lead space walker on the flight and served as the flight engineer for the rendezvous and docking phase and the

undocking phase of STS-98. In addressing the crowd at Ellington Field, he took a step back from the flight and from the successful installation of the lab onto the space station to ponder the future.

"This is the first shuttle mission in the new century. We have a crew aboard the space station that will be the forerunners for dozens of crews to come over the next several decades. And when you think about all of that, it's science fiction come true. We have an outpost in space that's expanding with every mission that we

conduct to it. It's a dream that 35 years ago people would have just chalked up to science fiction. Here it is coming true in our lifetime. And it's just an example of what we can do when we put dreams into reality and then put our efforts and our determination and our courage collectively into an effort like this.

"And because we can do things like the space station and putting the Destiny laboratory in place, we know together that when we're asked to go to farther places, to more distant places, to more

challenging destinations, we're going to be able to put that into reality as well. So we're going to leave Earth orbit behind once the station is complete and we'll be back on the Moon, and we'll be places like the asteroids and on Mars quicker than somebody can ask us to do it if we're just given the license to do that." ■



STS98-E-5195

Astronaut Thomas D. Jones, STS-98 mission specialist, waves at crew mates inside *Atlantis's* crew cabin while working on the International Space Station (ISS) during the second of three scheduled space walks involving himself and astronaut Robert L. Curbeam and assisted by their STS-98 astronauts aboard *Atlantis*.

Space archive to be established at UH-Clear Lake

The University of Houston-Clear Lake will receive and maintain Johnson Space Center's historical records under a memorandum of understanding signed during a recent ceremony at UHCL.

The agreement is part of the continuing effort by NASA and JSC to share historic information with the public.

The ceremony formalizing the agreement, between JSC, UHCL and the National Archives and Records Administration, was held in the Alfred R. Neumann Library at UHCL. JSC officials and UHCL President Dr. William Staples joined in the signing of the agreement, which has been approved and signed by the Archivist of the United States.

The center's history collection includes copies of correspondence, memos, reports, interviews and other materials documenting the history and role played by the center in NASA's human space flight program.

The first series of documents to be moved are records of the Apollo Program, which had once been kept at the Woodson Research Center at Rice University's Fondren Library. More than 1,000 oral history interview tapes, transcripts and videos documenting the men and women that worked on the Mercury, Gemini and Apollo programs will be included in the initial move.

Records scheduled for later transfer include material on the space shuttle, space

station and the general history of JSC.

Archives to house the records are under construction in the library, and should be completed later this year. The archives will be open to students, researchers and the public.

"Transfer of the center's history collection to UHCL will allow easier access to this material by scholars

and the general public," says JSC Historian Glen Swanson.

A great deal of unprocessed material in the center's history collection needs attention, Swanson said. Those records transferred to UHCL will free up additional on-site space for processing this backlog of material, which can then be cataloged and indexed before joining the rest of the collection at the university.

The expanded UHCL archives will be staffed by a full-time archivist and other trained support personnel who will be able to assist researchers in using the collection. The UHCL archives will

be a secure, environmentally controlled facility that meets National Archives and Records Administration standards.

Researchers will have access to an electronic index for the entire collection. Efforts are under way to digitize the collection, so the database can be linked to the documents, enabling researchers to

electronically search the collection and retrieve digital scans of the documents through the Internet. Plans call for this database to be moved to a public Web site, providing users with remote access.

Under the agreement, the transfer will be for an initial 10-year loan period, with options for possible extension. ■



NASA JSC 2001e039002 Photo by Bill Stafford
Dr. William Staples, president, University of Houston-Clear Lake, and Vicki Pendergrass, director, NASA/Johnson Space Center Information Systems Directorate, sign a memorandum of understanding allowing UHCL to receive and maintain JSC history archives. Also attending the signing ceremony, from left, are Dr. Joseph McCord, director, Alfred Neumann Library, UHCL; Glen Swanson, JSC historian; Patti Stockman, JSC records manager; and Larry Sweet, chief, Information and Imaging Sciences Division, JSC.

Space research institute increases scope

The National Space Biomedical Research Institute (NSBRI) is increasing its scope by funding 86 research projects in 19 states and adding four new research areas.

"With these projects, the Institute can better explore the health-related problems associated with long-duration human space flight," said Dr. Bobby R. Alford, NSBRI chairman of the board and CEO. "There are many physical and psychological challenges that must be addressed before women and men can explore our solar system."

The NSBRI was established in 1997 through a NASA competition to create a consortium of leading research institutions working toward the goal of reducing health concerns related to exploration missions. Twelve institutions comprise the NSBRI consortium and are responsible for its program development.

The 86 projects, funded for one- to

three-year periods, will be carried out at 67 institutions involving 250 researchers in 19 states. Selected from a group of 281 research proposals, each project underwent rigorous independent peer review by a panel of scientists not affiliated with the Institute.

These new projects mark the first time the NSBRI has selected its projects through an open, competitive solicitation process. Approximately one-half of the projects are slated for universities and laboratories outside the consortium.

All projects address key issues related to human health in space and are carried out by integrated theme-based teams of scientists. Many of the health issues will be faced by International Space Station crews and will pose an even greater threat to crews exploring other planets.

By adding four new teams, the NSBRI now focuses on 12 research areas.

The new areas—nutrition, physical

fitness and rehabilitation; neurobehavioral and psychosocial factors; integrated human function; and smart medical systems—will allow more complete coverage of health issues related to two-to-three year exploration missions.

Research issues for the new teams include:

- ❖ How much and what type of food is needed to maintain proper nutrition?
- ❖ What type of exercise and rehabilitation is needed before, during and after the flight?
- ❖ How can astronauts best cope with separation from family and Earth?
- ❖ What type of leadership style and crew composition is most suitable?
- ❖ How can medical diagnoses be made and treatments delivered in deep space?
- ❖ How do the solutions or activities implemented to maintain the integrity of specific parts of

the body—bone, heart and muscles—affect the total body?

"Like the original eight research areas, these new teams hold potential for advancing prevention and treatment issues on Earth," Alford said.

NSBRI's other teams address bone loss, muscle weakening, cardiovascular changes, sleep disruption and vigilance, immunology and infection, balance and orientation, radiation exposure and medical research technology needs.

The NSBRI consortium includes Baylor College of Medicine, Brookhaven National Laboratory, Harvard Medical School, The Johns Hopkins University, Massachusetts Institute of Technology, Morehouse School of Medicine, Mount Sinai School of Medicine, Rice University, Texas A&M University, University of Arkansas for Medical Sciences, University of Pennsylvania Health System and University of Washington. ■

Fifth space station element delivered to NASA

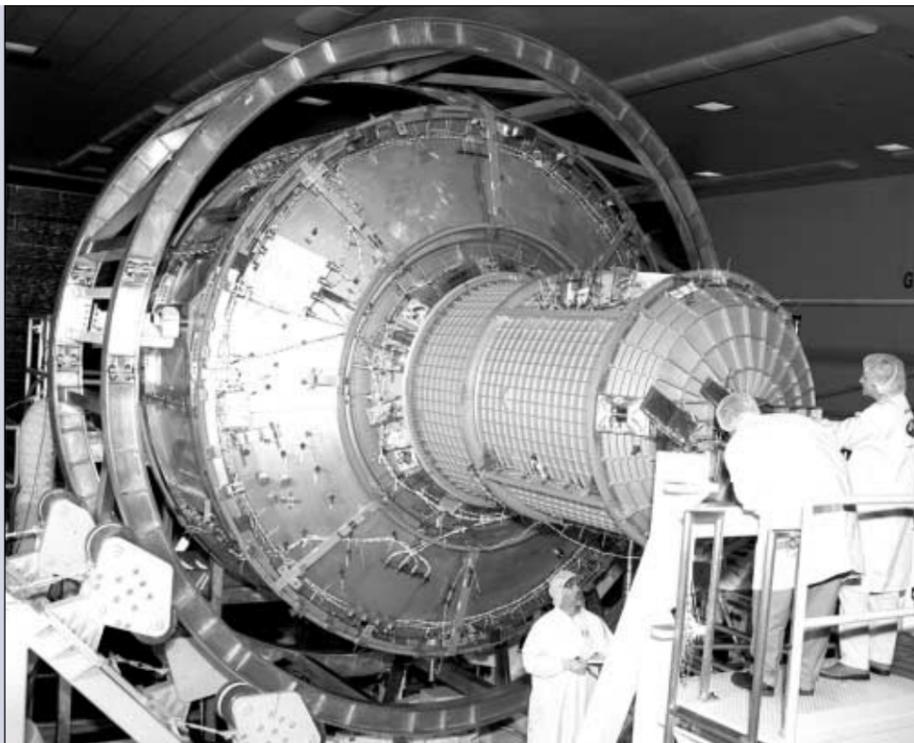
The Joint Airlock was officially handed over to NASA recently by members of Boeing's Airlock Program teams from Houston, Kennedy Space Center, Canoga Park and Huntsville. This official sign-off marks the completion of the Phase II Space Station Program and paves the way for the launch of the Joint Airlock scheduled for June 8 on STS-104.

The 6.5-ton, 20-foot-long Airlock will be connected to the right

side of the Unity module. It has two components—a crew lock from which astronauts and cosmonauts exit the International Space Station and step into space, and an equipment lock used for storing gear.

The handover of the Joint Airlock marks the fifth in a series of major elements turned over to NASA—the Unity node was handed over in 1997 and the integrated truss structures Z1 and P6 and the Destiny Laboratory were handed over last year. ■

In its final days at NASA's Marshall Space Flight Center facilities in Huntsville, Ala., the International Space Station's Joint Airlock Module undergoes exhaustive structural and systems testing, prior to being wrapped and lifted into a protective container for its flight to Kennedy Space Center, Fla.



JSC to observe National Women's History Month

The theme of this year's Women's History Month is "Celebrating Women of Courage and Vision." The National Women's History Project is honoring six women whose lives and work exemplify both courage and vision. The honorees can be found at <http://www.nwhp.org/whm/themes/themes> and include Astronaut Ellen Ochoa.

In observance of Women's History Month, JSC is having a live web cast March 15 from noon to 1 pm. The web address will be announced on the QUEST website:

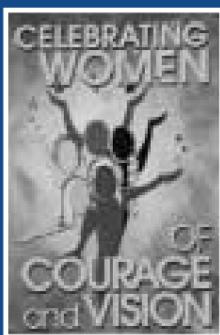
<http://quest.nasa.gov/space/>

Panelists include Dr. Linda Shackelford and Janis Davis-Street.

Dr. Shackelford is a Mississippi native and received her undergraduate degree in chemistry and biology from the Mississippi University for Women. She got her M.D. from the University of Mississippi School of Medicine before joining the Army in 1980. She has worked at Johnson Space Center since 1991, except for eight months of service in Germany, as she is a lieutenant colonel in the Army Reserve. She is currently the head of the Bone Lab, a position she assumed in 1992. She works in Medical Operations with post-flight astronaut bone issues and rehabilitation.

Janis Davis-Street grew up in Georgetown, Guyana, located on the northeastern coast of South America. She attended school in Ontario, Canada, and completed graduate school in Alberta. She immigrated to the United States in 1987 and has lived in Houston ever since. She is currently a nutritionist working in Life Sciences.

The women will each have five to ten minutes to give a brief background of why they chose the science field and then will take turns answering questions from people around the world. A second web cast will feature Vanessa Ellerbe, Dorothy Rasco and Gladys Henderson on March 28. Look for an update in the next *Roundup*.



Volunteers become role models at Expanding Your Horizons conference

The Expanding Your Horizons in Math and Science Career Conference For Girls was held January 27 at the University of Houston-Clear Lake. The NASA workshops and booth were a success for the third time this conference has been held in Clear Lake, thanks to close to 20 employees who gave up a beautiful Saturday to inspire a younger generation of potential NASA employees.

"I have been lucky enough to have a wonderful family and incredible teachers," says Mamta Patel, a co-op in the Space Flight Training Department. "But, I know that others are not so fortunate. So, any time that I can give back to young girls...I do it. It makes my day to see those girls smile."

Another co-op, Kelly Halacka, who works in Space and Life Sciences, was impressed with the maturity and curiosity of the students. "It was reassuring for me to see the future of the engineering field."

Other volunteers were Anne Roemer, Dr. Jaelyn Allen, Jean Carter, Carolyn Krumrey, Sharon McDougale, Shannon Melton, Jennifer Wilds, Ericka Brewer, Jessie Hendrick, Dr. Marguerite Sognier, Irene Verinder, Rhonda Moore, Dr. Marilyn Lindstrom, Gretchen Thomas, Elizabeth Fountain and Lt. Col. Timothy Creamer.

The Math Science Network located at Mills College in California has promoted, conducted and sponsored Expanding Your Horizons conferences across the country for almost 20 years. Working with co-sponsoring agencies including the American Association of University Women and Girl Scouts of America, more than 350,000 students in 35 states and Canada have been served. Locally, NASA JSC has supported EYH for six years. During that time, more than 1,400 local middle school girls have attended hands-on interactive workshops designed to foster an interest in math and science. Many JSC and contractor employees have volunteered to present workshops,

Students and volunteers participate in one of many workshops at the EYH conference.



Co-ops Jennifer Wilds, Ericka Brewer and Mamta Patel explain to students why they chose to pursue engineering degrees.



staff the JSC booth, and work as general conference help.

The booth was a stopping point for the more than 600 students in attendance. Jessie Hendrick of the JSC Equal Employment Opportunity Program Office helped each girl find a position at NASA where she may be needed one day. Even those students who expressed interests outside of science or math were included. Hendrick would simply ask if they played a sport, played in the band, or sang in the choir at school. Then she would relate the teamwork skills they are learning during these activities to the ones they would need as a member of the Space Shuttle Program or the NASA JSC Team Exploration, which designs advanced space missions to the moon, Mars, and asteroids. Dr. Sally Ride was the keynote speaker. "(She) did a wonderful job presenting the space program and providing

enthusiasm towards math and science," says Jennifer Wilds, a co-op with Titan-LinCom Corporation in the Guidance, Navigation & Control Division. Wilds is one of many who views Ride as a role model. "Having the opportunity to meet a role model is exciting, but getting to be recognized as a role model to younger girls in the same day is rewarding!" ■

Jessie Hendrick talks with a student interested in a career with NASA.



Former attendee returns after five years

These volunteers do become role models, as Marguerite Sognier learned firsthand from the EYH conference she worked at five years ago. Sognier presents one of the most popular workshops, titled "Bubble, Bubble, Boil and Puzzle."

According to the program, students in the workshop "get to perform fun, hands-on laboratory experiments to experience the life of a research scientist." Sognier takes care to always have a new, exciting lesson for the students to learn. She makes up a "goo" that the students must observe. Then, they record observations in a laboratory notebook that Sognier helps to design. This notebook is actually the way Sognier found out that her workshop made an impact on one student, Georgia Everett.

Everett attended the Bubble, Bubble, Boil and Puzzle session five years ago and is now in her senior year at Clear Creek High School. After a talk with a teacher about the goo that Sognier designed, she called U.T.M.B. and got in contact with Sognier to get the recipe. The two got to talking and had breakfast one morning. Sognier learned that Everett plans to attend college and pursue a science-related career. "She is an outstanding young lady," Sognier said.



Marguerite Sognier gives her "Bubble, Bubble, Boil and Puzzle" workshop.

Everett came to help Sognier in the afternoon sessions for this year's conference, and got to be a role model herself. Sognier explained to the students that Everett "was in your chair five years ago. She's now made it through high school and will be pursuing a science-related field in college." Everett plans to get involved in the medical field.

Everett said that the conference made her aware of the many opportunities for women. She also said that Sognier helped her to realize that medical school is attainable. "From someone who scans the applications at the U.T.M.B., and turns

down (students with) 4.0s for those with 3.7s and extracurricular activities, she made me feel better. She said as long as I want to go, I will," said Everett.

Sognier trains the workshop presenters before the conference every year. She makes sure to tell them to "keep in mind that there will be at least one girl whose life is changed because of that workshop. That is your inspiration for it." After finding out that Everett was affected, Sognier said, "you always know in your heart that you've made a difference. But it is very rare that you see the person and know that difference has been made." ■

Community News

Conference provides educators a lesson on space station

Educators from around the world came to Houston Feb. 9-10 to get new ideas on how to integrate the most exciting project at NASA into their lesson plans.

Space Center Houston's International Space Station Educators Conference, now in its seventh year, is held for educators in all disciplines. They attend lectures and interactive workshops to gather ideas for motivating their students.

Space Center Houston started the conference seven years ago, so that the space station would be used in schools today as a current event. The organizers believe that teaching science and space all day, while getting the other topics covered, is possible. "Space is exciting," said



Kathryn Clark, former chief scientist of the ISS and keynote speaker at the conference. "The more a teacher can make it (learning) fun, the better. I'm a huge believer in entertaining your audience and then sneaking a little education in when they're not looking."

This amazing conference is a result of preparation by NASA, both JSC and Headquarters, Boeing and many more individuals that help to make it a success. Some of the volunteers return year after

year. ISS Commander Bill Shepherd has been present in some manner for at least the last five years. He used to communicate via satellite when living in Star City, then last year he appeared in person. This year, he promised he would talk from outer space and sent down a video



to play at the conference. This boosts the morale of the teachers even more, according to Susan Tortorici, a member of the Education Outreach Department at Space Center Houston, that Shepherd thinks enough of the conference and the educators that he would take time out of a busy schedule to follow through with their requests.

The 620 attendees from 42 states, Japan and Canada included teachers, principals, pre-service teachers and college professors, museum educators and even the education departments of Marshall Space Flight Center and Kennedy Space Center. The educators that come to the conference are truly dedicated.

Past attendees have returned to present workshops, like a music teacher who came back to explain how she produced a musical in her hometown about the ISS based on the information she received at the conference years before.

Other attendees return to share what they've done at their schools. One school converted the entire gymnasium into the ISS for six weeks. Parents were recruited to build the modules and fifth graders took turns spending three days inside the ISS as astronauts and outside as CAPCOMs.

The participants leave the conference inspired and rejuvenated about their career choice. Feedback questionnaires

got responses such as "I liked best 'the time to share and renew your souls,' and thank you for treating teachers as professionals!" Space Center Houston's major focus is to conduct the conference so that the teachers feel like the professionals they are, according to Tortorici, herself a former teacher. "Teachers are professionals. Teachers are the beginning. They are the key to the future of the space program." ■



Diving instructor goes over some diving basics for a simulated ISS underwater construction at Clear Lake High School.

JSC Fellowship Program

JSC will again sponsor the JSC Fellowship Program which provides a select number of employees the opportunity to attend graduate school for one continuous year on a leave with pay basis. The center strongly supports such opportunities because they contribute to organizational goals through advanced academic training and enhance professional and personal growth. The criteria for this competitive program include:

- Past performance in contributing to organizational mission and goals
- Applicability of the chosen area of study and its effectiveness in contributing to the achievement of JSC's mission and goals
- A brief statement of academic purpose from the applicant
- Academic record of the applicant
- Written recommendation from the division chief
- Activity level in the employee's office and the employee's own workload

Applicants must be permanent employees with at least three years of continuous civilian service at JSC which may include co-op time. Applicants are responsible for their application and acceptance to graduate school and travel expenses. JSC will pay tuition and related fees. Regular

"The NASA Fellowship program provides an invaluable opportunity for exploring new ideas and concepts. This program is especially beneficial because it allows you to focus completely on gaining knowledge away from the distractions and crises of work. Returning to work, applying the knowledge gained encourages 'thinking outside the box' – the very quality that makes space programs such an exciting place to be!"

– Sharon L. Thomas

service agreements requiring a period of three times the length of training will apply to the program.

Interested employees can request an application from Susan White at extension 37011 and should contact their training coordinators for directorate-specific guidelines. The complete application package should be forwarded to Susan White in the Human Resources Development Branch (AH3) no later than Monday, April 23, 2001. ■

JOHNSON SPACE CENTER EAA PORTRAIT OFFER TO OUR EMPLOYEES

PICTURE THIS...

A 10X13 FAMILY PORTRAIT ON CANVAS

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DATE: Saturday, March 24
**PLACE: Gilruth Center, Bldg. 207,
Rms. 204 and 206**

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Ripped from the ROUNDUP

Ripped straight from the pages of old Space News Roundups, here's what happened at JSC on this date:

1 9 6 6

After two holds, a scrub and a scrub of a scrub, Saturn/Apollo 201 lifted off Launch Complex 34 at Kennedy Space Center last Saturday at 10:12 am CST for a near perfect flight some 5000 miles down the Eastern Test Range to landing 35 miles from the prime recovery ship.

The unmanned suborbital development flight for qualifying the Apollo command module heatshielding, service module prime propulsion system, and first flight trial for the Saturn IB was postponed twice from its scheduled launch date of February 23 because of poor weather in the launch area.

The first hold in Saturday's launch occurred when the count went all the way to zero, but the automatic sequencer called for a shutdown at T-04 seconds when first stage nitrogen sphere pressures dropped below acceptable limits.

1 9 7 6

Water hyacinths are "bustin" out all over the vicinity of a NASA laboratory and show real promise of providing the raw material for many useful products. That is the opinion of the NASA scientists who have spent the past year in experimentation centered on the aquatic plants as a filtration system for purification of polluted waters, as the source of bio-gas for fuel, as a protein and mineral additive to cattle feed, and as a soil fertilizer and conditioner.

The investigative program is carried out at NASA's National Space Technology Laboratories, Bay St. Louis, Miss., under the direction of biochemist Bill Wolverton, who states in a preliminary report that results substantiate theoretical data, and that "an expanded research effort might be the start of a permanent solution to present problems such as natural gas shortages, pollution control and control of excessive plant growth in certain waters, in addition to producing large quantities of fertilizer from the methane gas production process."

1 9 8 6

For the first time scientists have used a team of two spacecraft in the far outer reaches of our solar system to provide major planetary information. The two spacecraft, Voyager 2 and Pioneer 11, conducted operations about two billion miles away from Earth. Voyager 2 scientists are studying the planet Uranus' magnetosphere, which is shaped by the solar wind. Pioneer 11, located about 558 million miles outside Uranus' orbit, monitored the planet's solar environment to provide a background for interpreting the findings of Voyager 2.

Braddy, Sasser earn Secretarial Excellence Awards

Beverly Braddy of the Space Shuttle Program Office and Carol Sasser of the Center Operations Directorate each recently received the Marilyn J. Bockting Secretarial Excellence Award in recognition of their exceptional contributions, professional competence, and personal dedication.



NASA JSC 2000e00115 by James Blair
Beverly Braddy

Beverly Braddy was recognized in December for her contributions as the lead secretary in the Space Shuttle Vehicle Engineering Office. The office had been without a lead secretary for more than four months during a period of management transition. Through hard work and dedication, she was quickly able to establish a new action tracking database for the office, synchronize the schedules of the manager and two deputies, and organize and implement a new filing system, including employee performance appraisals, training and technical issues. The action-tracking database Braddy developed is Web-based and found on the SSVEO homepage and enables employees and its customers to track and see the status of all SSVEO actions.

Braddy's efforts have gone a long way in making the SSVEO run more efficiently during a very dynamic time, including new management for the office, reorganization and hiring of new employees.

Carol Sasser was recognized in January for her contributions as secretary to the director of center operations. She was selected to this position in 1998 as the only secretarial support in the directorate suite supporting seven directorate-level staff personnel. In the short span of slightly more than two years, Sasser has supported four different managers in the high-level position of director, as well as a major reorganization of the entire directorate, and has managed to maintain great functional stability throughout.



Sasser has been actively involved in helping lead a Continuous Improvement Team to decide the best use of existing secretarial resources, which has led to a teaming concept requiring another reorganization of the COD secretarial personnel. Sasser has been instrumental in working with the secretaries to affect a smooth transition in this endeavor. ■

NASA JSC 2000e00116 by James Blair
Carol Sasser

JSC to observe St. Patrick's Day



On Friday, March 16, the JSC St. Patrick's Day Observance will be held from 11:30 a.m. to 12:30 p.m. in the Bldg. 3 cafeteria. Come hear the St. Thomas Episcopal School Pipe Band perform.

Founded in 1962 by then rector, T. Robert Ingram, to provide a unique signature for the school, the St. Thomas Episcopal School Pipe Band began quite humbly. Its first instructor was an itinerant and not a very good piper. But gradually, over the years, the quality of instruction and play increased. Now the band is a popular performer at local and national events, having played for presidents and the Queen of England.

In 1998, the band won its third Juvenile World Pipe Band Championship, establishing it as one of the premier pipe bands in the United States.

The band is very active in the Houston community. As a band and as individuals, the pipers and drummers perform three to four times a month. The band has played for the Multiple Sclerosis Foundation, the M.D. Anderson Christmas Card Campaign Kickoff Parade, Houston Grand Opera, the Houston Ballet's Christmas Tree Celebration at the Wortham Center and the Galveston Historical Society's Dickens on the Strand Festival. The band is also the unofficial pipe band of the Harris County Sheriff's Department.

The band's largest local performance is its annual Scottish Festival held at the Compaq Center. Held in March, the band, along with about 150 Scottish dancers from St. Thomas, puts on a two-hour Edinburgh Tattoo-style extravaganza.

Last summer the band went on a five-week competition tour of Canada and Scotland where it won five first-place prizes out of six contests, including the Grade III North American Championship, the Juvenile World Championship, and the prestigious Cowal Championship, established in the early 1900s.

Having mastered traditional Scottish music, the band is now embarking into new territory combining keyboards, guitars and world beat percussion with the pipes and drums to create exciting new music while not forgetting the old.

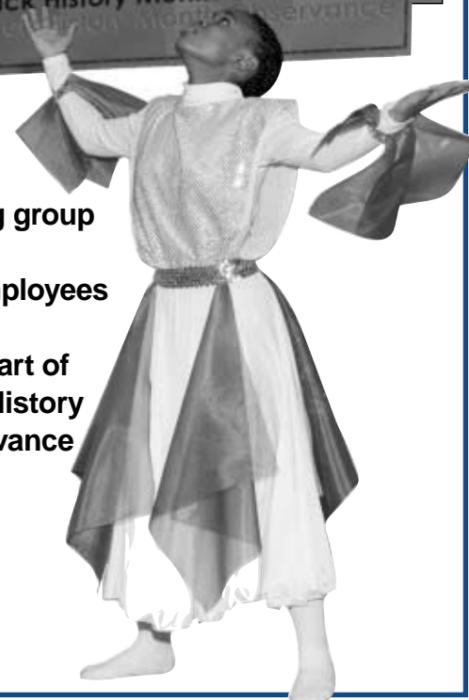
Don't miss this special St. Patrick's Day performance by this outstanding band! ■

JSC observes Black History Month

NASA JSC 2001-00414-418 Photo by David DeHoyos



The recording group For the Lord entertains employees in the Bldg. 3 cafeteria as part of JSC's Black History Month Observance held Feb. 14.



TICKET WINDOW

	JSC Price	Gate Price (includes tax)
AMC Theaters.....	\$ 5.00	\$7.50
Astroworld Early Bird (purchase by June 17)	\$19.50	\$38.96
Astroworld One Day Admission.....	\$20.50	\$38.96
Astroworld 2 Day Admission.....	\$31.00	\$43.29
Fiesta Texas Adult.....	\$21.50	\$38.82
Fiesta Texas Child (under 48").....	\$18.75	\$19.42
Moody Gardens (2 events).....	\$10.75.**	\$27.01 all day
** ticket does not include Aquarium Pyramid		
Moody Gardens - Aquarium only.....		\$ 9.25
Sea World adult.....	\$30.00	\$36.75
Sea World child (ages 3-11).....	\$20.50	\$25.93
Space Center Houston.....	\$ 9.25	\$16.18
JSC civil service employees free.		

Check out our new Web site on the JSC People page at: <http://hro.jsc.nasa.gov/giftshop/>

Exchange Store hours

Monday-Friday
Bldg. 3 7 a.m.-4 p.m.
Bldg. 11 9 a.m.-3 p.m.

- All tickets are nonrefundable.
- Metro tokens and value cards are available.
- Sweetwater Pecans \$6.25 per lb.
- Chocolate-covered Pecans \$8.00 per lb.

For additional information, please call x35350.

Please bring your driver's license to pay by personal check.



Massachusetts Institute of Technology educator wows White Sands Test Facility audience

by **Cheerie R. Patneau**

At a joint dinner meeting of the White Sands Test Facility's local chapters of the American Institute of Aeronautics and Astronautics (AIAA) and the National Management Association (NMA), MIT Associate Professor Dava J. Newman, Ph. D., spoke on her investigation of human movement and motor control performance across the spectrum of gravity. She spoke to an attentive audience about "Human Space Exploration from Mir to Mars," where she highlighted astronaut activities on the space station, as well as preparations for a human mission to Mars.

In the audience were the Las Cruces and Mayfield High School teams that will fly on NASA's KC 135A microgravity simulator aircraft. They will also be able to conduct experiments in microgravity, where the students will have about 20-25 seconds of experimenting each time the airplane achieves microgravity.

Because of their own interest in the skills and experiments that Dr. Newman had completed, the students were pleased to ask subject-related questions. Las Cruces High School student Stephen Smith asked, "if NASA studied John Glenn, then why isn't NASA considering using younger subjects to study the effects of microgravity on humans?"

Newman replied that the bone loss experienced in deep space (between 10 - 40 percent of bone density) was considered permanent and therefore harmful. She is currently testing a gravity bed, where space travelers can sleep while combating the detrimental effects of weightlessness. Newman also gave the students some hard-won advice, "Don't rush in to conduct your experiments, wait for microgravity, and take the drugs NASA offers you," she

said alluding to the feeling of nausea experienced by microgravity flyers on the "Vomit Comet."

Newman presented data on the largest case study of astronauts-cosmonauts in modern history. She has collected motor control movement on a whopping 20 astronauts-cosmonauts during the combined participation in the Mir Space Station, space shuttle flights, and the International Space Station. She reported that her study began with data from four astronauts, so the current pool of information is unprecedented. Newman collects data on all the movements her subjects make, including simple movements such as opening doors or more complex ones such as falling down.

Gail Bennett, NMA programs co-chair, was "impressed with Dr. Newman's credibility. Obviously, she has worked with many cosmonauts and astronauts, and her work is very well-organized and researched. Local high school students, who will be flying on the KC-135 later this year, attended the meeting and couldn't wait to talk to Dr. Newman about her experience on the aircraft. I particularly enjoyed the study about how the brain controls reflexes and muscles in zero gravity."

Stephen McDougle, AIAA treasurer, said about the meeting, "Dr. Newman was very timely with her presentation, and after seeing the interaction with her audience, I can see why her students voted for her for the MacVicar Faculty Fellow Award, MIT's highest honor for excellence in undergraduate education. Additionally, she interspersed her presentation with firsthand work experience with anecdotes about Glenn, Aldrin, or Russian cosmonauts. She is enthusiastic about her work, which she obviously enjoys."

Moiria Romansky, NMA member, said



Ken Schaaf, president, National Management Association; Dava Newman, Ph. D.; and Steve McDougle, treasurer, American Institute of Aeronautics and Astronautics, were among the attendees at the recent joint dinner meeting of the White Sands Test Facility's local AIAA and NMA chapters. Newman, an associate professor at the Massachusetts Institute of Technology, spoke to attendees about her investigation of human movement and motor control performance across the spectrum of gravity.

she had "learned so much," during the lecture. "What interested me the most was Dr. Newman's research into spacesuits, where she considered the drastic temperature change from the toes to the torso and the torso to the head. I did not realize the temperature change was so great in such a short distance. I was equally impressed with her research with the flexibility and dexterity of the future suits. She loves her work and is impressive."

Don Henderson, project leader, hypervelocity, at White Sands Test Facility, was also impressed with Newman's work. He believes though that "a possible limit may exist on what the suits could do, if they were to be made from a more flexible material. The suits have to protect the astronauts from micrometeoroid and orbital debris. Each layer works much like a Kevlar® vest does for a policeman." Henderson said that a MMOD's velocity could range

from "10 to 20 kilometers per second with velocities doubling when two objects collide from opposite directions. With this kind of velocity, the astronauts need all the protection they can get, possibly at the risk of foregoing dexterity."

White Sands Test Facility's Honeywell Technology Solutions Inc. Program Manager Bob Baker thought Newman's lecture "was an excellent opportunity for a local audience to see this kind of cutting-edge technology up close."

White Sands Test Facility's NASA Manager Joe Fries commented on "the insightfulness of the presentation, applicable for us here at the test facility. Dr. Newman reflects a bright future for NASA, with passion for her work." Fries believes that "we must have vision like hers for big leaps in technology advancement." He felt "fortunate in having AIAA bring in someone with credentials like Dr. Newman's." ■

Employees earn Space Act Awards

Last year, NASA Headquarters recognized the work of a number of JSC employees with Space Act monetary awards. The awards were presented during a ceremony Feb. 13. The following is a list of recipients.

TECH BRIEF AWARDS

Todd J. Hinkel
Richard J. Dean
Scott C. Hacker
Douglas W. Harrington
Remote Pneumatic Press System (\$150)

Scott M. Lazaroff
Arturo Vasquez
Self-Regulating Fuel Cell Pre-Humidification, Water Removal and Product Water Separation System (\$150)

Patrick W. Fink
Improved Circularly Polarized Microstrip Antenna (\$150)

Ed Lu
Jean L. Chretien
Variable Shadow Screen for Optical Devices (\$150)

Darby F. Magruder
Video Mosaicking for Pipe Inspection (\$150)

Kriss J. Kennedy
TransHab Soft Stowage Array (\$150)

Kriss J. Kennedy
TransHab Phase Two Layout: Configuration Concept (\$150)

Chatwin A. Lansdowne
Scatter in Binomial Trials with Skewed Populations (\$150)

Scott M. Smith
Determination of Ferritin-Iron by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) (\$150)

Michael E. Fowler Jr.
Resin Transfer Molded Tool Face (\$350)

Dennis R. Morrison
Cell Radiation Experiment System (\$350)

Chris S. Lovchik
Compact Linear Drive (\$150)

Chris S. Lovchik
Synthetic Bursa (\$350)

J. David Jochim
Chris S. Lovchik
Fully Magnetically Actuated Docking and Refueling Mechanism for Satellite Servicing (\$150)

Larry W. Abbott
Gary L. Cox
Hai D. Nguyen
Universal Mini Controller (\$350)

David J. Homan
Charles J. Gott
Display Software Package for JSC Training Simulators (\$350)

Todd J. Hinkel
Richard J. Dean
Scott C. Hacker
Douglas W. Harrington
Hydraulic Loading Fixture (\$350)

Todd J. Hinkel
Carl W. Hohmann
Richard J. Dean
Scott C. Hacker
Douglas Harrington
Pyrotechnic Resistance Welder (\$350)

Robert O. Shelton
ROVer Ranch - An Online Robotics Workshop (\$350)

Kathryn M. Hurlbert
Rack-Mountable Composite Coldplate Shelf (\$350)

William C. Schneider
James P. Locke
Deceleration Limiting Safety Crash Wall (\$350)

J. David Jochim
Fail-Safe Electromagnetic Motor Brake (\$350)

Carl D. Scott
Visual Control of Arc Process for Carbon Nanotube Production (\$350)

Carl D. Scott
Automatic Control of Arc Process Production of Carbon Nanotubes (\$350)

Chi-Min Chang
Dominic L. Del Rosso
Double Acting and Locking Carabiner (\$350)

PATENT APPLICATION AWARDS

David A. Wolf
Thomas J. Goodwin
Growth Stimulation of Biological Cells and Tissue by Electromagnetic Fields and Uses Thereof (\$350)

Robert L. Shuler Jr.
Method and Apparatus for Reducing the Vulnerability of Latches to Single Event Upsets (\$500)

Phong H. Ngo
G. Dickey Arndt
Microwave Medical Treatment Apparatus and Method (\$350)

William C. Schneider
James P. Locke
Horacio M. De La Fuente
Portable Hyperbaric Chamber (\$350)

Patrick W. Fink
Improved Microstrip Patch Antenna and Method (\$500)

James L. Lewis
Androgynous, Reconfigurable Closed Loop Feedback Controlled Low Impact Docking System with Load Sensing Electromagnetic Capture Ring (\$350)

Franklin R. Chang-Diaz
Variable Specific Impulse Magnetoplasma Rocket Engine (\$500)

Michael K. Ewert
Solar-Powered Refrigeration System (\$350)

SPACE ACT BOARD AWARDS

Scott M. Smith
A Food Frequency Questionnaire for Determination of Nutrient Intake During Extended-Duration Missions (\$300)

Donald L. Henninger
Douglas W. Ming
Slow Release Fertilizer: Active Synthetic Soil (\$400)

Charles J. Gott
David J. Homan
Display Software Package for JSC Training Simulators (\$1,500)

Patrick M. O'Neill
William X. Culpepper
Gautam D. Badhwar
Radiation Susceptibility Assessment of NASA Flight Hardware Using High-Energy Protons (\$7,500)

PEOPLE on the **MOVE****Human Resources reports the following personnel changes:****Key Personnel Assignments**

Debbie Denton-Misfeldt was named chief, Human Resources Development Branch, Human Resources Office.

Additions to the Workforce

Susan White joins the Human Resources Development Branch, Human Resources Office, as an academic development programs specialist.

Nicole Cloutier, *Beth Nischik* and *Cathy Watson* join the Public Affairs Office as communications specialists.

Brian Kubena joins the Flight Design and Dynamics Division, Mission Operations Directorate, as an aerospace engineer.

Gurpartap Sandhoo joins the Orbit Dynamics Branch, Flight Design and Dynamics Division, Mission Operations Directorate, as an aerospace engineer.

Matthew Abbott joins the Flight Director Office, Mission Operations Directorate, as a flight director.

Deborah Graham joins the Management Services Office, Mission Operations Directorate, as a computer specialist.

Christine Worstell joins the Electrical Systems Branch, Systems Division, Mission Operations Directorate, as a flight controller.

Jordan Metcalf joins the Life Support and Habitability Systems Branch, Crew and Thermal Systems Division, Engineering Directorate, as an aerospace engineer.

Michael Baine joins the Propulsion and Fluids Systems Branch, Energy Systems Division, Engineering Directorate, as an aerospace engineer.

Tara Ruttle joins the Biomedical Hardware Development and Engineering Office, Engineering Directorate, as a life sciences payloads engineer.

Steven Del Papa joins the Thermal Branch, Structures and Mechanics Division, Engineering Directorate, as an aerospace engineer.

Adam Gilmore joins the Structures and Dynamics Branch, Structures and Mechanics Division, Engineering Directorate, as an aerospace engineer.

Timothy Rupp joins the Structural Mechanical Design/Analysis Branch, Structures and Mechanics Division, Engineering Directorate, as an aerospace engineer.

Edward Wilson joins the Imaging Science Branch, Information and Imaging Sciences Division, Information Systems Directorate, as a telecommunications specialist.

Jill Lin joins the Flight Crew Equipment Management Office, Space Shuttle Vehicle Engineering Office, Space Shuttle Program, as a project engineer.

Cathy Dempsey joins the GFE Flight Projects Office, International Space Station Program, as an aerospace engineer.

Steve Nunez joins the International Space Station Program, as a special assistant to the ISS program manager.

Sean Melody joins the Moscow Technical Liaison Office, International Space Station Program, as an aerospace engineer.

James Krupovage joins the Administration Office, White Sands Test Facility, as a computer engineer. *Chris Allen* joins the Crew Station Branch, Flight Projects Division, Space and Life Sciences Directorate, as an acoustics engineer.

Jeff Patrick joins the EVA Project Office, as an EVA Integrated Product Team ISS increment lead.

Promotions

Mara Pena was selected as an administrative assistant in the Biomedical Hardware Development and Engineering Office, Engineering Directorate.

Kim Curton was selected as an inventory management specialist in the Property and Equipment Branch, Logistics Division, Center Operations Directorate.

Reassignments to Other Centers

Ronald Lentz moves to Headquarters.

Timothy Adams moves to Kennedy Space Center.

Reassignments to Other Directorates

Alison Rickerl moves from the Safety, Reliability, and Quality Assurance Office to the Mission Operations Directorate.

Steve Duran moves from the Mission Operations Directorate to the Engineering Directorate.

Chirold Epp moves from the International Space Station Program to the Engineering Directorate.

Marcia Kerr moves from the Space Shuttle Program to the Engineering Directorate.

Randall Moore moves from the Mission Operations Directorate to the Space Shuttle Program.

Chi-Min Chang moves from the Engineering Directorate to the International Space Station Program.

Retirements

Betty Holt of the Office of Procurement.

Donald Lewis of the Mission Operations Directorate.

Arnold Levine of the Engineering Directorate.

Clifford Thompson of the Engineering Directorate.

Linda Perez of the Information Systems Directorate.

Bob Nooney of the Center Operations Directorate.

Raymond Nieder of the Space Shuttle Program.

Resignations

R S. Brown of the Office of Procurement.

Paul Vallejo of the Engineering Directorate.

NASA BRIEFS**SPACE MAPPING MISSION CATCHES ANTARCTICA IN MOTION**

Antarctica may appear to be a land frozen in time, but it certainly is not still. Glaciers plow down the continent's center to the sea, icebergs snap off and crash into the ocean, and great rivers of ice snake through the ice sheet, evidence of a dynamic relationship between this remote continent and global climate.

A joint NASA and Canadian Space Agency mission now provides a more comprehensive view of how the Antarctic ice sheet moves and changes and may help answer some fundamental questions about this mysterious place at the end of the world, including whether the ice sheet is advancing or retreating.

The initial mapping campaign, the 1997 Antarctic Mapping Mission, resulted in the first high-resolution radar satellite map of the continent. The second phase, the Modified Antarctic Mapping Mission, completed last November, once again charted Antarctica with space-based imaging radar. This second mission gives scientists a way to see how the continent has changed over the past three years as well as a wealth of new information on the movement of the most active region, the outer half of the ice sheet.

Mission scientists are now developing velocity maps showing the direction and speed of the ice. They have already created the first-ever complete velocity maps of the spectacular Lambert Glacier, a sinuous ice stream more than 500 kilometers (311 miles) long, which reaches speeds of more than one kilometer (about two-thirds mile) a year once the ice spreads onto the Amery Ice Shelf.

They are also beginning to create a new map of Antarctica to compare with the one made in 1997. The process of turning the radar images into map-quality mosaics will take about a year to complete. More information on the mission is available on the Internet at:

<http://www-bprc.mps.ohio-state.edu/radarsat>

NASA TO HOST 32ND LUNAR AND PLANETARY SCIENCE CONFERENCE AT JOHNSON SPACE CENTER

Ancient life on Mars, oceans on Europa, a rendezvous with an asteroid - these are just a few of the many fascinating topics that will be covered at the 32nd Lunar and Planetary Science Conference, March 12-16, 2001, at the NASA Johnson Space Center in Houston.

More than 450 scientists will present their research at JSC's Gilruth Center beginning at 8:30 a.m. Monday, March 12. Oral presentations will continue through Friday morning, March 16. Some scientists will also present their results on posters from 7 to 9:30 p.m. Tuesday and Thursday, in the Bayou Building at the University of Houston - Clear Lake. The media are invited to attend both the oral and poster sessions.

The conference, which is chaired by Carl B. Agee of JSC and David C. Black of the Lunar and Planetary Institute, will also include presentations on water, glaciers and volcanoes on Mars; earthquakes on Venus; and the effects of past asteroid impacts on the Earth.

DATES & DATA**MARCH 9**

Astronomers meet: The JSC Astronomical Society meets at 7:30 p.m. at the Boeing Cafeteria in the Boeing Building at the end of Space Center Boulevard. For more information contact Chuck Shaw at x35416 or go to the website:

<http://www.ghg.net/cbr/jscas/>

Chess Club meets: The Space City Chess Club meets each Friday evening March 16, 23, and 30 from 5:30 p.m. until 9 p.m. at the Clear Lake United Methodist Church, 16335 El Camino Real, room 423. All skill levels are welcome. For more information, please call James Mulberry at x39287 or James Termini at x32639.

MARCH 12

Aero Club meets: The Bay Area Aero Club meets at 7 p.m. at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information contact Larry Hendrickson at x32050 or go to www.bayareaaeroclub.org

MARCH 13

IAAP meets: The Clear Lake/NASA Chapter of the International Association of Administrative Professionals meets at 5:30 p.m. in the Colonial Room at Grace Community Church, 14325 Crescent Landing. Cost is \$12. Bonnie House presents

CPS/CAP (Certified Professional Secretary/Certified Administrative Professional). For details, contact Elaine Kemp at 281-483-0556.

Aero Club meets: The Bay Area Aero Club meets at 7 p.m. at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information contact Larry Hendrickson at x32050 or check out www.bayareaaeroclub.org.

MARCH 14

Astronomy seminar: The JSC Astronomy Seminar Club will meet at noon today, Feb. 21 and 28 in Bldg. 31, Rm. 248A. For more information contact Al Jackson at x35037.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters meet on March 14, 21 and 28 at 11:30 a.m. at United Space Alliance, 600 Gemini. For more information contact Patricia Blackwell at (281) 280-6863.

MAES meets: The Society of Mexican-American Engineers and Scientists meets at 11:30 a.m. in Bldg. 16, Rm. 111. For more information contact Laurie Carrillo at 281-244-5203.

Spaceland Toastmasters meet: The Spaceland Toastmasters meet on March 14, 21 and 28 at 7 a.m. at the House of Prayer Lutheran Church 1515 Bay Area Blvd at Reseda. For more information, contact Ava Sloan at 713-768-6336 or asloan@halpc.org

SPACE CENTER Roundup

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